

We claim:

- 1 1. An integrated optical circuit comprising:
  - 2 an input waveguide;
  - 3 an imaging multimode interference device adapted to substantially remove all
  - 4 modes but a fundamental mode of an optical signal received from said input
  - 5 waveguide; and
  - 6 an optical power splitter structure in optical communication with said imaging
  - 7 multimode interference device.
- 8 2. The optical circuit of claim 1 wherein said multimode interference device includes
- 9 a primary output in optical communication with said optical power splitter structure
- 10 and a secondary output in optical communication with a dump port.
- 11 3. The optical circuit of claim 1 wherein said imaging multimode interference device
- 12 is a 1-to-1 device.
- 13 4. The optical circuit of claim 3 wherein said imaging multimode interference device
- 14 has a structure designed to reduce optical backreflections.
- 15 5. A method for suppressing propagating lateral waveguide field oscillations at the
- 16 input of an optical power splitter structure comprising fabricating an imaging
- 17 multimode interference device in optical communication with said optical power
- 18 splitter structure.
- 19 6. The method of claim 5 wherein said multimode interference device includes a
- 20 primary output in optical communication with said optical power splitter structure and
- 21 a secondary output in optical communication with a dump port and said method
- 22 further comprises receiving an error signal from said dump port and monitoring said
- 23 error signal for a substantial change.
- 24 7. The method of claim 5 wherein said optical power splitter structure is a
- 25 component of a interferometric modulator.

1 8. The method of claim 7 wherein said interferometric modulator is a Mach-Zehnder  
2 modulator.

1 9. An integrated optical circuit comprising an imaging multimode interference device  
2 in optical communication with an optical power splitting structure.

1 10. An integrated optical circuit comprising:

2 a semiconductor optical amplifier having an angled output; and

3 an imaging multimode interference device between said semiconductor  
4 optical amplifier and said angled output.

1 11. The integrated optical circuit of claim 10 wherein said further has an angled input  
2 and said imaging multimode interference device is a first imaging multimode  
3 interference device and said integrated optical circuit further comprises a second  
4 imaging multimode interference device between said semiconductor optical amplifier  
5 and said angled input.

1 12. An integrated optical circuit comprising:

2 a waveguide device having an angled output; and

3 an imaging multimode interference device between said waveguide device  
4 and said angled output.

1 13. Use of an imaging multimode interference device as an optical mode stripper in  
2 an integrated optical circuit.

1 14. Use of an imaging multimode interference device to substantially remove all  
2 modes but a fundamental mode of an optical signal received at an input to said  
3 multimode interference device.

1 15. A semiconductor optical amplifier comprising:

2 an imaging multimode interference device adapted to substantially remove all  
3 modes but a fundamental mode of an optical signal received from an input  
4 waveguide; and

5 an electrode in contact with said multimode interference device adapted to  
6 change the optical properties of said multimode interference device through  
7 application of an electrical signal.

1 16. An optical attenuator comprising:

2 an input waveguide;

3 an imaging multimode interference device adapted to substantially remove all  
4 modes but a fundamental mode of an optical signal received from said input  
5 waveguide; and

6 an electrode adapted to apply a bias voltage to a surface of said imaging  
7 multimode interference device.